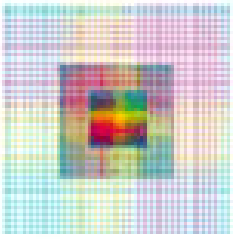

AUDIT II

Country Report
ESTONIA

Sulev Soosaar
Draft 16.12.2002

SUMMARY OF ENERGY AUDITING

Background and Present National Energy Policy

In Estonia the first energy audits, both in industry and residential sector, were carried out in frames of international assistance programmes in the beginning of 1990s. Despite of some activities in this field there is still no system or approved methodology for energy audits in Estonia.

Estonia has signed the *United Nations Framework Convention on Climate Change* in 1992. In 1994 Estonia signed *The Energy Charter Treaty*. In December 1998 Estonia signed the *Kyoto Protocol of the UN FCCC.* In this protocol Estonia committed to reduce greenhouse gas emissions by 8% 2001-2012 against 1990. The Protocol was ratified in September 2002.

In August 2002 the Government approved *Memorandum of Understanding to participate in the Community programme SAVE for the year 2002*.

Sustainable Development Act sets the most general principles for sustainable development and therefore forms the basis for formulation of national and regional policies and programmes. As to the energy issues, the major strategy document is *The Long-term National Development Plan for the Fuel and Energy Sector* in which the targets are set for development of the fuel and energy sector up to the year 2005 and principal development trends given till 2018. The current *Energy Act* was entered into force in 1998. The Act regulates the fuel and energy markets, and state supervision over the fuel and energy sector. As to legislation directly related to energy efficiency, *Energy Efficiency of Equipment Act* entered into force in July 2001.

There is neither energy agency nor any institution with similar functions in Estonia. The major governmental unit responsible for energy issues is the Energy Department of the Ministry of Economic Affairs and Communications

Energy Audit Programmes

There are no Energy Audit Programmes in Estonia.

Conducting energy audits was one of the planned activities laid down already in the *Energy Conservation Target Programme* in 1992. However, because of ongoing restructuring of production, changes in ownership and lack of standard simple methods for regular auditing, the audits have not been conducted

The *Implementation Plan of the Energy Conservation Target Programme* includes a project for introduction of methods for conducting energy audits in industrial enterprises (Project no. 5). The planned Project consists of two sub-projects that focus on developing methods for preparing energy audits in industrial enterprises (2001-2003) and setting up relevant organizational system (2003-2005). The planned methods for conducting energy audits in industrial enterprises are based on the EU Directive 93/76/EEC (SAVE). All these activities will be co-ordinated by the Ministry of Economic Affairs and Communications.

In 2001 a Danish assistance project on energy auditing was started in framework of the *Danish-Estonian Sector-Integrated Environmental Co-operation Programme in the Field of Energy*. Under two sub-programmes, both linked to the EU SAVE Directive, the general aim is to establish sustainable energy auditing in industry and in buildings.

Other Programmes including Energy Audits

There are no ongoing other programmes, which include energy audits.

Introducing Energy Certification of Buildings

The *Implementation Plan of the Energy Conservation Target Programme* includes a project for development of methods for energy certification of buildings (Project no. 4). The Project consists of two sub-projects, which include development of certification methods (2001 – 2003) and setting up an organizational system as well as launching of certification (2003 – 2005). Funding will be provided form state budget for partial financing of the certification programme. In the course of the activities, sample test certifications will be conducted in local governments and county governments.

The programme will be co-ordinated by the Ministry of Economic Affairs and Communications involving also non-profit organisations that are active in housing matters.

Negotiations to obtain foreign assistance shall be held with the Danish Energy Authority and the Finnish Ministry for Trade and Industry. In addition, international experience will be obtained through the co-operation projects of OPET network.

Other Activities including Energy Audits

Despite the lack of approved methodology and system for energy audits, several audits have been carried out in Estonia for several years already. These have been mainly audits carried out in the frames of foreign or international aid programmes: PHARE Energy, US AID, Danish, Finnish, Norwegian, Swedish, etc. programmes.

Energy audits have been carried out also by specialists from Tallinn Technical University and by several energy-related consulting companies.

Energy audits have been included in preparation process of energy development plans for many municipalities in Estonia.

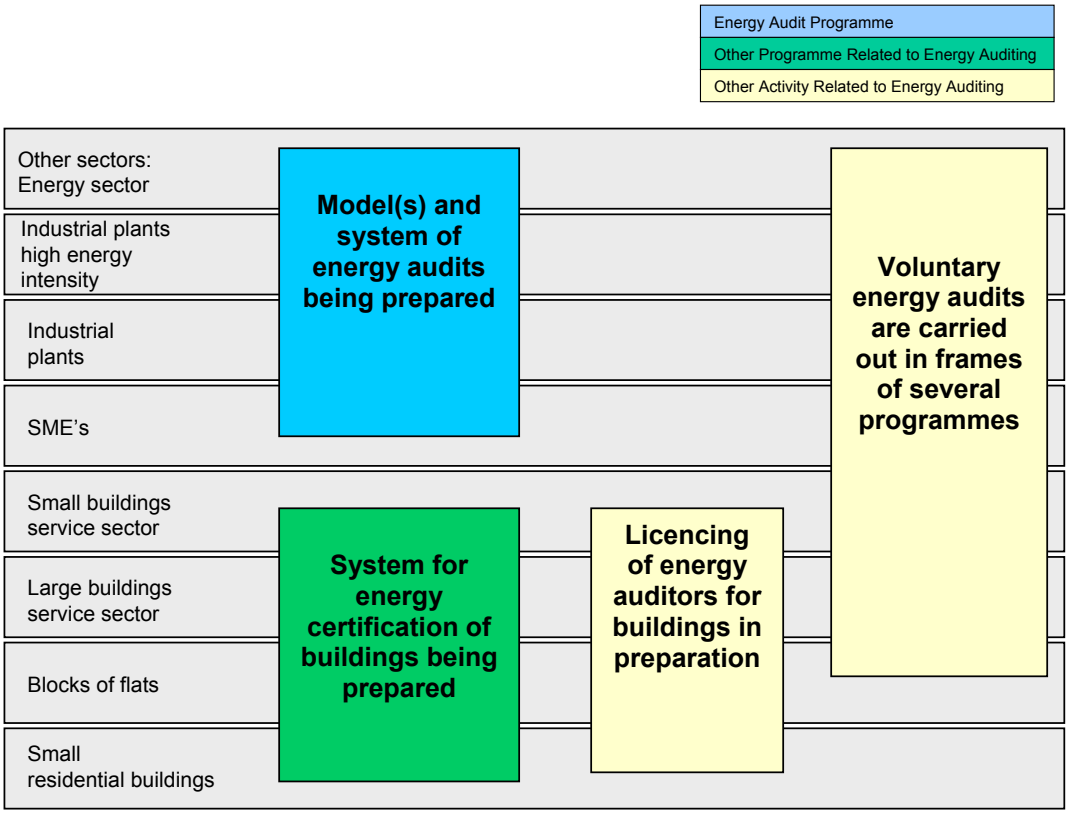

Figure 1. The Map of energy audits in Estonia

Table of EAP features coverage

	Introduction of methods and system for energy auditing in industry	Development of energy certification methods and introduction of certification
Status	2001 - 2005	2001 - 2005
Administration	Ministry of Economic Affairs and Communications	Ministry of Economic Affairs and Communications
EA models	+	++
Auditors' tools	++	++
Training, authorisation		+
Quality control		
Monitoring		
Volumes, results		
Evaluation		

+++ = Detailed information available
++ = Some information available
+ = Very little information available
= No information available / does not exist

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Country Report

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THE COUNTRY REPORT

Table of Contents

1 Background and Present National Energy Policy

1.1 Previous activities

In Estonia the first energy audits, both in industry and residential sector, were carried out in frames of international assistance programmes in the beginning of 1990s. Despite of some activities in this field there is still no system or approved methodology for energy audits in Estonia. However, more attention has been drawn to the practice of energy audits during last years. For example, the OPET[1] Estonia has disseminated relevant information. Experience of energy audits in EU countries has been also presented in several cases, e.g. in December 1999 an information leaflet about energy audits in EU Member States was published. In September 2000 an international training course *Climate Technology and Energy Audit as a Tool for Improved Energy Efficiency* was held in Tallinn. The event was organised in co-operation between the Estonian Energy Research Institute, OPET Estonia, OECD/IEA Climate Technology Initiative and the Danish Energy Agency. There were 72 participants from 14 countries. In 2001 a booklet (63 pages) *Energy Audit Guide for Buildings* prepared by Axovaatio Oy/AX Consulting (Finland) was published in two volumes – in Estonian and the other one in Russian and English. The publication was financed by the Finnish Ministry of Environment. In the process of translation the recommendations were adopted to Estonian situation and some comments added.

1.2 Present national energy policy

1.2.1 International agreements and conventions

As to international agreements related to environment and energy, Estonia signed the *United Nations Framework Convention on Climate Change* (UNFCCC) during UN Conference on Environment and Development in Rio de Janeiro in 1992. In May 1994, the Estonian Parliament, the Riigikogu, approved the ratification of the Convention. In 1994 Estonia signed *The Energy Charter Treaty* (ECT). The ECT, together with the *Protocol of Energy Charter on the More Efficient Energy Use and the Related Environmental Aspects*, were ratified by the Parliament of Estonia in February 1998, and entered into force in August 1998. In December 1998 Estonia signed the *Kyoto Protocol of the UN FCCC.* The Protocol was ratified in September 2002. In this protocol Estonia committed to reduce greenhouse gas emissions by 8% 2001-2012 against 1990.

In 1995 Estonia signed the European Agreement and applied for membership of EU. Foreign Ministry has set 1 January 2003 as a possible target date for accession preparations. Therefore, the recent policy developments in Estonia have been concentrated on accession to the EU and the requirements this brings about for the energy sector. The approximation of EU legislation in all fields is in its very final phase. In the end of July 2002, the energy chapter (no. 14) of accession negotiations was provisionally closed.

Regarding to direct issues of energy efficiency, on 27 August 2002 the Government approved *Memorandum of Understanding to participate in the Community programme SAVE for the year 2002*.

[1] OPET – *(Network of) Organisations for the Promotion of Energy Technology* – an European Commission supported project, initiated to disseminate information on application of innovative, energy efficient and environmentally friendly energy technologies. OPET network is managed and supervised by DG TREN (Transport & Energy).

1.2.2 National legislation

Sustainable Development Act sets the most general principles for sustainable development and therefore forms the basis for formulation of national and regional policies and programmes. The Act is guided by principles given in the resolution of the UN Conference of Environment and Development (Rio de Janeiro, 1992).

As to the energy issues, the major strategy document is *The Long-term National Development Plan for the Fuel and Energy Sector* (hereinafter the Plan). The Plan was approved by the Riigikogu (Parliament) in 1998 as a national level document for the energy sector. In the Plan there are set targets for development of the fuel and energy sector up to the year 2005 and principal development trends given till 2018. As to practical activities on energy efficiency, it is provided in the Plan (Article 5.8) that the Government shall initiate and finance the actual system of energy conservation.

The *Estonian National Environmental Strategy*, approved by the Parliament in 1997, is the major basis document for the policy-making process in the field of environment. Among others the following energy-related goals are fixed: to direct energy policies towards energy efficiency technology development programmes, more extensive use of renewable energy resources and reduction of greenhouse gas emissions.

In the *National Environmental Action Plan* (NEAP), adopted by the Government in May 1998, there are defined concrete conceptual, legislation, organisational, educational, training and also investment measures for reaching the objectives set in the National Environmental Strategy. The NEAP defined both short-term (for 1998 - 2000) and long-term (2001 - 2006) actions for the ten priority goals. To take into account changes in Estonian economy and to specify the needed actions, the Ministry of Environment organised the revision and updating of the first NEAP. As an outcome of this process, the NEAP for 2001 - 2003 was prepared. The document was approved by the Government in June 2001. The implementation process of the NEAP is in progress.

The *Energy Act* was entered into force on January 1, 1998. The Act has been amended in 1998, 1999 and in 2001. The Act regulates the fuel and energy markets, and state supervision over the fuel and energy sector. It has been decided to replace the present Energy Act with several acts regulating more specific fields of energy sector.

As to energy efficiency and conservation, in the Bill of District Heating Act there is an article (§9) stipulating that the Government shall approve the Energy Conservation Programme together with its implementation plan.

Energy conservation became a priority early after Estonia regained its independence. The first national energy conservation programme came into force via Governmental approval on 24 July 1992. This was a response to the rapid increase on the price of imported fuels and thus a main objective of the programme was to reduce the consumption of imported fuels.

In continuation of the national energy conservation programme a new programme was developed in 1999 under the title *Energy Conservation Target Programme*. This was done in reflection to the evaluation of the previous programme and the new challenges of the energy sector, especially with regard to Estonia's accession to the EU and the related requirements. The EU directive 93/76/EEC (SAVE) was taken into consideration in the drafting of the Programme. It was adopted by the Government in January 2000. This document was followed by the *Implementation Plan for the Energy Conservation Target Programme (IPECTP)*, which was approved by the Government in March 2001. Both the programme and the implementation plan cover the period 2001-2005.

As to legislation directly related to energy efficiency, *Energy Efficiency of Equipment Act* entered into force on 1 July 2001. The Act establishes requirements for the consumption of energy and other essential resources by equipment, as well as labelling of equipment in order to increase the efficiency of the consumption of energy and to decrease environmental danger created by equipment. Some regulations of the Minister of Economic Affairs as acts of secondary legislation under the *Energy Efficiency of Equipment Act* have been issued during 2002. Drafting of secondary legislation continues to bring Estonian legislation in this sector into full compliance with the EU requirements.

For the purposes of update of the energy policy goals of Estonia, the Ministry of Economic Affairs and Communications has started the process of drafting new *Long-term Development Plan of the Energy and Fuel Sector*. The draft plan should be presented to the Government by the end of 2002.

1.3 Institutional aspects

There is neither energy agency nor any institution with similar functions in Estonia. The major governmental unit responsible for energy issues is the Energy Department of the Ministry of Economic Affairs and Communications (MEAC; till 1 November 2002 Ministry of Economic Affairs). The energy efficiency is in scope of tasks of the Energy Conservation and Renewables Division of the Department.

There are two institutions dealing with energy issues subordinated to MEAC:

- the Estonian Energy Market Inspectorate (EMI) and
- the Technical Inspectorate (TI).

EMI is responsible for implementing the state control, supervision of and monitoring the fuel and energy market, including the issuance of market licences and price control. Due to the current energy situation in Estonia the main tasks of the EMI as energy market regulator are mainly connected to licensing and the supervision of power transmission, distribution and sales tariffs and the power generation prices of power plants, which are in market dominating position.

TI is responsible for state supervision of potentially dangerous technical equipment and industrial processes. The function of the Inspectorate is to reduce to a minimum the risk of accidents, which may result in pollution of the surroundings and injuries to people. It is the duty of the Inspectorate to follow general trends of technical development and to co-ordinate basic and in-service training programmes at relevant training centres.

The procedures of technical inspection of pressure equipment (incl. boilers) are carried out by another institution – Tehnokontrollikeskus OÜ – the center of technical inspection, which is a limited company out of government administrative domain.

During several years there have been held discussions on need of establishing an energy agency or an institution with similar functions. At present, the Energy Agency is preliminary planned to be established in 2003 with the aim to promote efficient use of energy and deployment of renewable energy sources, as well as to administer energy statistics and information exchange/dissemination.

2 Energy Audit Programmes

There are no ongoing Energy Audit Programmes in Estonia.

2.1 Developing methods for energy audits in industry

Conducting energy audits was one of the planned activities laid down already in the *Energy Conservation Target Programme* in 1992. However, because of ongoing restructuring of production, changes in ownership and lack of standard simple methods for regular auditing, the audits have not been conducted and there are usually no data available on energy intensity of industrial production.

The *Implementation Plan of the Energy Conservation Target Programme* (see section 1.2.2) includes a project: Development of methods for conducting energy audits in industrial enterprises (Project no. 5). In the description of the Project it is noted that in planning energy saving activities in specific industries and in the industry in general, systematic auditing on the basis of standard forms and requirements is very important, including data collection to a database, as well as analysis and generalisation of ways to improve the situation both on the company level, branch level and national level. The planned Project consists of two sub-projects that focus on developing methods for preparing energy audits in industrial enterprises and setting up relevant organizational system.

The planned methods for conducting energy audits in industrial enterprises are based on the EU Directive 93/76/EEC (SAVE) that obliges member states to prepare and implement programmes for preparing energy audits for industrial enterprises.

In Estonia there are a number of industrial enterprises that are large energy consumers and have a relatively large potential for saving energy. Standard methods for conducting energy audits would enable to compare the intensity of energy consumption and potential of saving energy of different industrial enterprises and to implement measures to save energy. The development of methods will be co-ordinated by the Ministry of Economic Affairs and Communications. In parallel with developing the auditing methods, 2-3 pilot audits have been planned to be conducted.

The main features of the Project are presented in the following Table.

Project period	2001-2005
Sub-projects	1. Development of methods for preparing energy audits for industrial enterprises in 2001-2003 2. Setting up organisational system in 2003-2005
Target groups	Enterprises
Project objectives	Development of energy auditing system for industrial enterprises and promotion of energy saving
Project outcomes, energy saving	Determination of specific energy consumption per production unit, implementation of energy saving measures and promotion of energy-efficient technologies
Responsible institution	Ministry of Economic Affairs and Communications
Total funding from state budget	300 000 EEK
Project co-financing	Own resources of industrial enterprises and, if possible, international co-operation projects

2.2 Danish-Estonian co-operation and energy audits

In 2000 the Ministry of Economic Affairs expressed its interest in receiving technical assistance for the implementation of the EU Directive 93/76/EEC (SAVE). Later the Danish Energy Agency (at present Authority) agreed on Danish support for the implementation of the two sub-programmes, linked to the SAVE Directive, in framework of the *Danish-Estonian Sector-Integrated Environmental Co-operation 2000 Programme in the Field of Energy*. The general aim of the project is to establish sustainable energy auditing and certification schemes. The main objective of the industry sub-programme was to introduce an energy auditing and management programme for the industry, including methodology and organizational set-up.

Danish consulting firm Ramboll was selected to carry out the project. The project was started in the beginning of 2001. The aim of the first phase was to investigate different options for implementation of the SAVE-directive's provisions regarding industry and buildings. A risk analysis was made for different models for increasing the energy efficiency in industry. As a result, a system of non-mandatory audits for industry was selected and partial subsidies system for audits proposed.

Due to change of the Government and institutional restructuring in Denmark there was a delay of several months in the project. In late summer 2002 the project was continued with the target to be completed in 2003. The next phases of the project would include:

- assessment of the environmental effect of selected auditing model;
- preparation of the proposal for the financing and for institutional set-up of a sustainable energy auditing scheme;
- drafting of terms of reference for practical projects, which can support the implementation of the models;
- assistance to education of auditors and development relevant tools;
- assistance to developing energy audit manual for industrial enterprises.

The results of the Danish assistance project enable to use Danish experience of energy auditing of industrial enterprises for introducing similar system in Estonia.

3 Other Programmes including Energy Audits

There are no ongoing other programmes, which include energy audits.

3.1 Introducing energy certification of buildings

The described above (section 1.2.2) *Implementation Plan of the Energy Conservation Target Programme* includes a project: Development of methods for energy certification of buildings (Project no. 4). In the Project description, there is noted that as a result of introducing market economy principles and successful implementation of pricing policy, Estonia has already achieved significant progress for reducing specific energy consumption of buildings. However, to continue this process and taking the specific consumption of energy to the level acceptable in the EU requires systematic approach, which includes energy certification of different types of buildings. The certification system and databases that are being created would enable to develop standard technical solutions for reaching energy saving targets for different building groups (various apartment buildings, one-family housing, social buildings, offices, etc.) and to monitor the actual impact of measures that are being implemented on energy consumption.

It is also noted that international experience has shown the certification of buildings as an excellent and relatively cheap means to increase the activity of all counterparts (apartment owners, building administrators, local governments, etc.) in implementing energy saving measures. The Estonian Federation of Apartment Owners' Associations has already started such practice as the need to determine and compare energy costs of buildings increases rapidly together with the growth of energy costs.

The Project consists of two sub-projects, which include development of certification methods, setting up an organizational system and launching of certification. The implementation of the energy certification of buildings is based on the EU Directive 93/76/EEC (SAVE) under which member states are obliged to prepare and implement energy certification programmes for building.

The energy consumption of Estonian residential buildings is significantly higher than that in developed industrial countries, which have similar climate. On the basis of studies, the average consumption of heat in Estonian residential buildings is around 250 kWh/m^2 a year while the corresponding figure in industrially developed countries with a similar climate is 150-230 kWh/m^2 a year. In Scandinavian countries, which are focused on energy saving issues, the average energy consumption of new and renovated buildings is 120-150 kWh/m^2 a year.

By implementing the energy consumption certification system of buildings, building owners and administrators will map vital information on energy consumption and will be able to put together a package of measures for reducing energy consumption.

According to the EU SAVE Directive, member states are required to conduct programmes for certification of buildings for energy consumption. The Estonian Ministry of Economic

Affairs and Communications will prepare standard method for conducting such certification, which will also form the basis of issuing respective certificates for buildings. Methods will be differentiated between apartment buildings, community buildings and small houses.

Funding will be provided form state budget for partial financing of the certification programme. In the course of the activities, sample test certifications will be conducted in local governments and county governments. The programme will be co-ordinated by the Ministry of Economic Affairs and Communications involving also non-profit organisations that are active in housing matters.

The main features of the project are presented in the following Table.

Project period	2001 – 2005
Sub-projects:	1. 2001 - 2003: Development of energy certification methods of buildings for different types of buildings and setting up a certification system 2. 2003 - 2005: Introduction of certification of buildings
Target groups	Different types of apartment buildings and small buildings, buildings owned by the state and by municipalities, schools, hospitals, etc.
Project objectives	The objective of energy certification of buildings is to prepare a certificate on the actual energy consumption, on the basis of which it would be possible to plan measures for reducing energy consumption and ensure the compliance of the buildings' price and running costs
Project outcomes, energy saving	Data of the certificate gives an overview of actual energy consumption and enables to optimize the implementation of energy saving measures. For an additional result the value of the real estate could be linked with energy costs of building maintenance.
Responsible institution	Ministry of Economic Affairs and Communications
Total funding from state budget	3.0 MEEK, incl. ➢ development of methods for building certification; • for apartment buildings: 300 000 EEK; • for community buildings: 300 000 EEK; • for small housing: 100 000 EEK; ➢ implementation of certification together with support to local governments and state-owned enterprises: 2.3 MEEK
Project co-financing	For developing methods and guidance, negotiations to obtain foreign aid shall be held with the Danish Energy Authority and the Finnish Ministry for Trade and Industry. In addition, international experience will be obtained through the co-operation projects of OPET network. Certification will partly be implemented from the resources of real estate owners, apartment owners and, in case of state or municipal buildings, from respective budgets, etc.

For implementation of the project Danish experience in this field is being taken into account. The Danish-Estonian co-operation programme (described in section 2.2) includes also a sub-programme for auditing and certification of buildings. More than ten different models for increasing the energy efficiency in building sector were described and briefly analysed. The aim of the first phase was to investigate different models for implementation of the SAVE-directive's provisions regarding building sector. After consultations with stakeholders four models (see Table) were selected for further analysis with the purpose of being implemented in Estonia. In all models the energy management includes energy audits as a major element.

Models	Object	Content	Subsidies	Mandatory
Model 1	Large buildings for housing purposes	Energy management	yes	no
Model 2	Large public buildings	Energy management	yes	yes
Model 3	Large commercial buildings	Energy management	no	no
Model 4	Small private buildings	Energy labelling and action plan	no	no

The Danish-Estonian co-operation project is in progress. The next phases of the project would include:

- assessment of environmental effect of selected model;
- preparation of a proposal for the financing;
- assistance in elaboration of the institutional set-up for energy certification schemes;
- drafting a plan for implementation of auditing and certification schemes;
- drafting of terms of reference for practical projects, which can support the implementation of the models;
- assistance to education of auditors and development of tools;
- R&D activities to work out standard solutions for buildings.

It has also been decided to consider, what would be the consequences of the proposed EU-directive on energy performance of buildings for the content of the schemes, i.e. certification of all kinds of buildings could be mandatory, if the directive in its present version would be adopted.

Another important aspect of audits and certification of buildings is education/training and approval of auditors. It was decided to distinguish between passing the exam as an auditor and the approval or certification of an auditor. In order to be eligible for performing the audits under the Governmental schemes, an auditor should be approved or certified. Passing the exam should be a precondition for being approved as auditor, but there would also be some other requirements to be fulfilled, e.g. insurance, etc. The project is planned to outline these requirements as well as preliminary guidelines for the detailed procedures of approval of auditors.

At present the training process of auditors for residential sector is in progress – 28 persons have been trained on 70 hour courses in TTU in August 2002. The relevant auditing instruction and practical manual has been prepared. As a parallel process, a detailed manual/handbook for energy audits in industry is being prepared by a team of Estonian experts. Support of Danish consultants should ensure the quality of these activities.

4 Other Activities including Energy Audits

Despite the lack of approved methodology and system for energy audits, several audits have been carried out in Estonia for several years already. These have been mainly audits carried out in the frames of foreign or international aid programmes: PHARE Energy, US AID, Danish, Finnish, Norwegian, Swedish, etc. programmes.

Energy audits have been carried out also by specialists from Tallinn Technical University (TTU): by Department of Thermal Engineering at Faculty of Mechanical Engineering and by Department of Environmental Engineering at Faculty of Civil Engineering. Since 1994 the latter department of TTU has also carried out research of heat and water consumption in approximately 250 residential buildings in larger cities (Tallinn, Tartu, Pärnu and Haapsalu).

In Estonia there are several energy-related consulting companies (approximately ten), which have participated in energy audit projects as sub-consultants for foreign companies, or carried out energy audits independently. The Regional Energy Centers (REC), which were established in the framework of a PHARE project in three smaller cities of Estonia, have assisted municipalities and smaller utilities in preparations for auditing and in several cases carried out audits as well.

In general, consulting companies have carried out audits mainly in industrial enterprises and residential buildings, but also in public buildings (e.g. schoolhouses) and district heating utilities.

Moreover, energy audits have often been elements in preparation process of energy development plans for municipalities. During last years tens of municipalities (of total number in Estonia 247) have drawn short- and medium-term development plans for local energy sector, as a part of general development plans. Consulting firms, which have prepared these plans, have usually carried out energy audits in major district heating utilities and quite often also in some typical residential houses as well. As a rule, all these audits have been quite elementary ones.

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Web-sites

www.mkm.ee – Ministry of Economic Affairs and Communications

www.eeri.ee – Estonian Energy Research Institute at Tallinn Technical University; OPET Estonia (in Tallinn)

Currency

1 EEK = 0.0639 €; 1 € = 15.6466 EEK (fixed exchange rate)